GCN CIRCULAR 21478, LIGO/Virgo G297595: INTEGRAL search for a prompt gamma-ray counterpart

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We investigated serendipitous INTEGRAL observations carried out at the time of the LIGO/Virgo burst candidate G297595. The satellite was pointing at RA=240.554 Dec=-55.181, far from the high-probability area of LIGO localization. For the full LIGO 90% confidence region the best upper limit is set by the anti-coincidence shield of the spectrometer on board of INTEGRAL (SPI/ACS). The localization of G297595 is close to optimal for SPI-ACS observation.

The INTEGRAL Burst Alert System (IBAS) did not identify any unusual transients in coincidence with the LIGO/Virgo trigger. The IBAS inspects both ISGRI Field of View and all-sky SPI-ACS light curve.

We investigated the SPI-ACS, IBIS/Veto, and IBIS/ISGRI light curves between -500 and +500 s from the trigger time (2017-08-14 10:30:43 UTC) on temporal scales from 0.1 to 100 s, and found no evidence for any significant deviation from the background. We estimate maximal 3-sigma upper
limits of 6.6e-7 erg/cm2 (75-2000 keV) for 8s duration assuming Band model parameters alpha=-1, beta=-2.5, and E_ peak = 300 keV. To derive a limit for a typical short burst with 1 s duration, we use a harder cutoff power law spectrum with a photon index of -0.5 and an Epeak = 500 keV. We find a limiting fluence of 2.1e-7 erg/cm2 (75-2000 keV) at 3 sigma c.l. Due to high particle background at the current phase of the Solar Cycle, these upper limits are somewhat higher than those that can be achieved by SPI-ACS in more favorable conditions.

We do not confirm the report by Pozanenko et al. 2017, GCN 21476. The fluctuation they report has an S/N marginally exceeding 3 sigma in an optimized time bin used by the authors. In our systematic search, based on predefined detection thresholds and time bins, this event is not detected with a sufficiently high significance to justify a report. We estimate post-trial significance of a long-timescale fluctuation shortly following G297595 at 1.9 sigma.

INTEGRAL is scheduled to perform pointed follow-up observations of the G297595 localization region.